

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : NEC MOBILE COMMUN LTD

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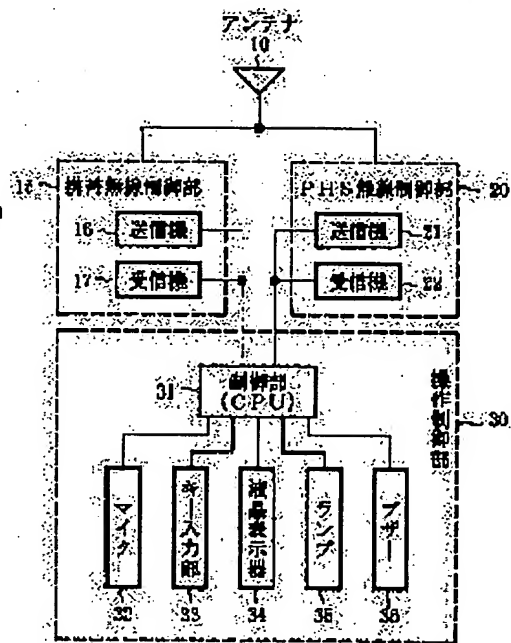
(72)Inventor : HIROYA YOSHITAKA

(54) MOBILE COMMUNICATION COMPOSITE TERMINAL AND IN-SPEECH HANDOVER SWITCHING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To continue speech by operating handover in the other system when handover fails in one system in a mobile communication composite terminal and a in-speech handover switching method for receiving a service in two different mobile communication systems.

SOLUTION: This mobile communication composite terminal is provided with two radio controlling part 15 and 20 for separately establishing, connecting, and releasing a radio channel in each of two different mode communication systems, an operation controlling part 30 for setting the validity/invalidity of the automatic switching of a communication mode at the time of waiting or in speech, and a communication mode switching controlling means 31 for operating the switching of a communication mode by allowing one of the two radio controlling parts to stop the transmission of radio waves and allowing the other radio controlling part to operate handover according to the set contents of the operation controlling part when the quality of speech through one of the two radio controlling parts is deteriorated, and the handover based on this fails.



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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, since a dual terminal performs a message according to an individual separately using the system of PHS, and the system of a cellular phone, it has the same problem as a PHS independence and cellular-phone independent case.

[0005] namely, PHS -- be -- a cellular phone -- be -- an electric-wave condition with a base station is grasped during a message, and when it moves to the location beyond the tolerance of a base station, a handover is carried out and it changes to other base stations -- it carries out. And when changing to other base stations goes wrong, it will not be able to return to the original base station, either, but the circuit under message will be cut. Now, the meaning of the dual terminal equipped with two functions with much trouble will be spoiled.

[0006] The purpose of this invention is to offer the handover change approach during the mobile communication complex terminal which a handover can be carried out [complex terminal] to the system of another side, and can make a message continue, and a message, when the handover in one system goes wrong.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] In recent years, the mobile communication complex terminal (henceforth a "dual terminal") having the function of a simple portable telephone (henceforth "PHS") and a cellular phone machine (henceforth a "cellular phone") is going to be developed, and practical use is going to be presented.

[0003] Although this dual terminal performs a message according to an individual separately using the system of PHS, and the system of a cellular phone, it can be awaited and can await the arrival from both systems in the time using that of dc-battery saving actuation. Thereby, it can talk over the telephone by either, and arrival of the mail can be received in few areas, underground centers, etc. of the number of installation of a base station. A user's convenience improves.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] This invention relates to the handover change approach during the mobile communication complex terminal which can be applied to the handover change approach during the mobile communication complex terminal which can receive service in two mutually different migration communication system, and a message, especially can be changed to the migration communication system of another side during a message, and a message.

[Translation done.]

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MEANS

[Means for Solving the Problem] The mobile communication complex terminal concerning invention according to claim 1 The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, When the quality of the message deteriorates during the message by one side of the control unit which awaits and can set up propriety of an automatic change of the communicate mode during the time or a message, and said two radio control sections and the handover based on it goes wrong, It is characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side according to the contents of a setting of said control unit, and changes the communicate mode.

[0008] According to this invention according to claim 1, when the quality of the message by one communication system deteriorates, change actuation of a service area is usually made by band over within the same system, but when that change actuation goes wrong, according to assignment of a user, the handover change to the communication system of another side is performed. Thereby, a message can be continued using the communication system of another side, without carrying out a recurrence call.

[0009] The mobile communication complex terminal concerning invention according to claim 2 is characterized by said communicate mode change control means making a handover perform in the radio control section of said another side immediately, when the contents of a setting of said control unit can be automatic changed in a mobile communication complex terminal according to claim 1.

[0010] According to this invention according to claim 2, when the message by one communication system becomes difficult by degradation of quality, handover change actuation to the communication system of another side is performed automatically, and a message can be continued using the communication system of another side.

[0011] The mobile communication complex terminal concerning invention according to claim 3 In a mobile communication complex terminal according to claim 1 said control unit It has an information means to report to a user with one side or the both sides of a display and singing. Said communicate mode change control means It is characterized by making the inquiry information to a user perform to a control unit, when the contents of a setting of said control unit are automatic change no, answering a change command input from a control unit, and making a handover perform in the radio control section of said another side.

[0012] According to this invention according to claim 3, when the message by one communication system becomes difficult by degradation of quality, according to a user's volition, in continuation of a message, handover change actuation to the communication system of another side is performed, and a message can be continued using the communication system of another side.

[0013] The mobile communication complex terminal concerning invention according to claim 4 The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, The contents of a setting of said control unit are referred to during the message by one side of the control unit which awaits and can set up propriety of a compulsive change of the communicate mode during the time or a communication link, and said two radio control sections. When a compulsive change is good, It is characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side, and changes the communicate mode.

[0014] Regardless of degradation of quality, according to a user's volition, handover change actuation to the communication system of another side is performed compulsorily, and, according to this invention according to claim 4, a message can be continued during the message by one communication system using the communication system of another side.

[0015] During the message concerning invention according to claim 5, the handover change approach [when two message changes between migration communication system connected to a public network mutually-independent are permitted] When a speech quality deteriorates during the message in one migration communication system and the handover based on it goes wrong, when an automatic change is good, with reference to the contents of a change setting of talk mode, it is characterized by performing a handover to the migration communication system of another side automatically.

[0016] During the message concerning invention according to claim 6, the handover change approach [when two message changes between migration communication system connected to a public network mutually-independent are permitted] When a speech quality deteriorates during the message in one migration communication system and the handover based on it goes wrong, when it is automatic change no, with reference to the contents of a change setting of talk mode A user is asked and it is characterized by performing a handover to the migration communication system of another side according to a change command input.

[0017] During the message concerning invention according to claim 7, the handover change approach carries out performing a handover to the migration communication system of another side immediately with reference to the contents of a change setting of talk mode, during the message in one migration communication system, when a compulsive change is good as the description, when two message changes between migration communication system connected to a public network mutually-independent are permitted.

[0018]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to a drawing.

[0019] Drawing 1 shows the configuration of the mobile communication complex terminal concerning the operation gestalt of this invention. This operation gestalt corresponds to claim 1 thru/or claim 7.

[0020] In drawing 1, this mobile communication complex terminal consists of common antennas 10, walkie-talkie control sections 15, PHS radio control sections 20, and actuation control sections 30.

[0021] The transmitter 16 and receiver 17 of the walkie-talkie control section 15 are connected to the main control section 31 of the actuation control section 30. Similarly, the transmitter 21 and receiver 22 of the PHS radio control section 20 are connected to the main control section 31 of the actuation control section 30. Receivers 13 and 23 have a field strength measurement function, respectively.

[0022] In the actuation control section 30, a microphone 32, the key input section 33, a liquid crystal display (LCD) 34, a lamp 35, and a buzzer 36 are connected to the main control section 31, respectively.

[0023] The main control section 31 is equipped with a central processing unit (CPU) and memory. Although the main control section 31 performs control which it awaits, and both the receivers 13 and 23 are operated by turns in the time, and awaits both sides, and individual control of the communication link by PHS, and the communication link by the cellular phone, it performs handover change control of this operation gestalt, and setting reception of the communicate mode further.

[0024] Next, drawing 2 shows the configuration of a communication network. In drawing 2 (1), the cellular-phone network 40 is constituted independently [a public network (ISDN network) 50] now. The base station in the cellular-phone network 40 has composition connected to a public network (ISDN network) 50 through a migration communications control station and a relay center. And the pin center, large which performs service control on the high order of a migration communications control station and a relay center existed, and accounting control, authentication control, service control, positional information, etc. are managed in the database.

[0025] On the other hand, the PHS network 60 consists of forms where the existing public network (ISDN network) 50 is utilized for the maximum. However, control is the same as that of the cellular-phone network 40, and the pin center, large which performs database management exists.

[0026] Here, although the base station is performing authentication for security here, it does not participate in control only by relaying the information about a handover, but the exchange and the control station which are performing information management control by control of a handover. That is, each service network can control the exchange and a control station separately.

[0027] So, in the communication network which can carry out the change between the systems by the handover of this operation gestalt, as shown in drawing 2 (2), the control stations 70 and 80 between systems which control a mutual service compartment are provided between the cellular-phone network 40 and a public network (ISDN network) 50 and between the cellular-phone network 40 and the PHS network 60. The control stations 70 and 80 between systems play the role of the mutual database management which manages each other information.

[0028] The correspondence relation between the above configuration and a claim is as follows. The walkie-talkie control section 10 and the PHS radio control section 20 correspond to the two radio control sections. The actuation control section 30 corresponds to a control unit. The main control section 31 mainly corresponds to a communicate mode change control means.

[0029] Hereafter, actuation of the change between the systems by the handover of this operation gestalt is explained with reference to drawing 1 - drawing 10. In addition, drawing 3 is the change explanatory view of the communication service of this operation gestalt. Drawing 4 is the flow chart of handover change actuation of this operation gestalt. Drawing 5 is explanatory views, such as a configuration procedure of a communicate mode change. Drawing 6 is a sequence under message with PHS/cellular phone.

[0030] Drawing 7 is the sequence of a handover change with PHS. Drawing 8 is the sequence of the handover change to a cellular phone from PHS. Drawing 9 is the related sequence of the network at the time of the handover in the same system, and a base station. Drawing 10 is the related sequence of the network at the time of the handover between systems, and a base station.

[0031] With this operation gestalt, it can change to the message by the cellular phone, without carrying out the recurrence call of the message by PHS, as shown in drawing 3. In drawing 3, the drawing 3 (1); dual terminal 100 grasps the electric-wave receive state of the PHS base station 102 of the PHS message area 101 present in use during the message by PHS. If degradation of an electric-wave receive state exceeds the tolerance of the PHS base station 102 which is carrying out current use in process of migration, the dual terminal 100 will presuppose that it changes by the handover to other PHS message area 103.

[0032] Drawing 3 (2); then [return and], when the actuation from which it moves to the PHS message area 103 of other PHS base stations 104 by the handover in that case goes wrong, the communicate mode is changed to a cellular phone by the handover in the location of the original PHS message area 101. A message can be continued without carrying out re-dialing in the pocket message area 106 by the pocket base station 105 in the location which overlaps the original PHS message area 101 mostly.

[0033] Drawing 3 (3) When the actuation from which it moves to; or the PHS message area 103 of other PHS base stations 104 goes wrong, it goes to the PHS message area 103 of a migration place, and the communicate mode is changed to a cellular phone by the handover there. A message can be continued without carrying out re-dialing in the cellular-phone area 108 which the pocket base station 107 in the location which overlaps the PHS message area 103 of a migration place mostly depends.

[0034] Specifically, a handover change is performed during such a message in the procedure shown in drawing 4. In addition, by drawing 4, in addition to the case of drawing 3 (S11-S19), although the communication link is normal, the procedure (S13 -> S20, S21 -> S19) for receiving service of the system of another side compulsorily is also shown.

[0035] drawing 4 -- setting -- the main control section 31 -- awaiting -- the time -- LCD34 -- "-- awaiting -- " -- it displays. this -- "-- awaiting -- " -- the cymbol of an antenna bar shows which service is awaited.

[0036] a user -- this -- "-- awaiting -- " -- when there is a display, a communicate mode change (handover change during a message) can be set up. When a user performs a setup about a communicate mode change, the main control section 31 incorporates and memorizes the contents of a setting (S10). The main control section 31 performs the change of the communicate mode according to the contents of a setting so that it may mention later. The contents of a setting are whether it permits that a dual terminal changes automatically and whether to permit a compulsive change. The concrete setting approach etc. is mentioned later (refer to drawing 5).

[0037] The main control section 31 will give an indication "under message" to LCD34 of the actuation control section 30, if a communication link is started (S11) (S12). This display is also a display of the purport which permits a setup of the communicate mode to a user.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[The technical field to which invention belongs] This invention relates to the handover change approach during the mobile communication complex terminal which can be applied to the handover change approach during the mobile communication complex terminal which can receive service in two mutually different migration communication system, and a message, especially can be changed to the migration communication system of another side during a message, and a message.

[0002]

[Description of the Prior Art] In recent years, the mobile communication complex terminal (henceforth a "dual terminal") having the function of a simple portable telephone (henceforth "PHS") and a cellular phone machine (henceforth a "cellular phone") is going to be developed, and practical use is going to be presented.

[0003] Although this dual terminal performs a message according to an individual separately using the system of PHS, and the system of a cellular phone, it can be awaited and can await the arrival from both systems in the time using that of dc-battery saving actuation. Thereby, it can talk over the telephone by either, and arrival of the mail can be received in few areas, underground centers, etc. of the number of installation of a base station. A user's convenience improves.

[0004]

[Problem(s) to be Solved by the Invention] By the way, since a dual terminal performs a message according to an individual separately using the system of PHS, and the system of a cellular phone, it has the same problem as a PHS independence and cellular-phone independent case.

[0005] namely, PHS -- be -- a cellular phone -- be -- an electric-wave condition with a base station is grasped during a message, and when it moves to the location beyond the tolerance of a base station, a handover is carried out and it changes to other base stations -- it carries out. And when changing to other base stations goes wrong, it will not be able to return to the original base station, either, but the circuit under message will be cut. Now, the meaning of the dual terminal equipped with two functions with much trouble will be spoiled.

[0006] The purpose of this invention is to offer the handover change approach during the mobile communication complex terminal which a handover can be carried out [complex terminal] to the system of another side, and can make a message continue, and a message, when the handover in one system goes wrong.

[0007]

[Means for Solving the Problem] The mobile communication complex terminal concerning invention according to claim 1 The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, When the quality of the message deteriorates during the message by one side of the control unit which awaits and can set up propriety of an automatic change of the communicate mode during the time or a message, and said two radio control sections and the handover based on it goes wrong, It is characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side according to the contents of a setting of said control unit, and changes the communicate mode.

[0008] According to this invention according to claim 1, when the quality of the message by one communication system deteriorates, change actuation of a service area is usually made by band over within the same system, but when that change actuation goes wrong, according to assignment of a user, the handover change to the communication system of another side is performed. Thereby, a message can be continued using the communication system of another side, without carrying out a recurrence call.

[0009] The mobile communication complex terminal concerning invention according to claim 2 is characterized by said communicate mode change control means making a handover perform in the radio control section of said another side immediately, when the contents of a setting of said control unit can be automatic changed in a mobile communication complex terminal according to claim 1.

[0010] According to this invention according to claim 2, when the message by one communication system becomes difficult by degradation of quality, handover change actuation to the communication system of another side is performed automatically, and a message can be continued using the communication system of another side.

[0011] The mobile communication complex terminal concerning invention according to claim 3 In a mobile communication complex terminal according to claim 1 said control unit It has an information means to report to a user with one side or the both sides of a display and singing. Said communicate mode change control means It is characterized by making the inquiry information to a user perform to a control unit, when the contents of a setting of said control unit are automatic change no, answering a change command input from a control unit, and making a handover perform in the radio control section of said another side.

[0012] According to this invention according to claim 3, when the message by one communication system becomes difficult by degradation of quality, according to a user's volition, in continuation of a message, handover change actuation to the communication system of another side is performed, and a message can be continued using the communication system of another side.

[0013] The mobile communication complex terminal concerning invention according to claim 4 The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, The contents of a setting of said control unit are referred to during the message by one side of the control unit which awaits and can set up propriety of a compulsive change of the communicate mode during the time or a communication link, and said two radio control

sections. When a compulsive change is good, It is characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side, and changes the communicate mode.

[0014] Regardless of degradation of quality, according to a user's volition, handover change actuation to the communication system of another side is performed compulsorily, and, according to this invention according to claim 4, a message can be continued during the message by one communication system using the communication system of another side.

[0015] During the message concerning invention according to claim 5, the handover change approach [when two message changes between migration communication system connected to a public network mutually-independent are permitted] When a speech quality deteriorates during the message in one migration communication system and the handover based on it goes wrong, when an automatic change is good, with reference to the contents of a change setting of talk mode, it is characterized by performing a handover to the migration communication system of another side automatically.

[0016]

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CLAIMS

[Claim(s)]

[Claim 1] The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, When the quality of the message deteriorates during the message by one side of the control unit which awaits and can set up propriety of an automatic change of the communicate mode during the time or a message, and said two radio control sections and the handover based on it goes wrong, The mobile communication complex terminal characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side according to the contents of a setting of said control unit, and changes the communicate mode.

[Claim 2] It is the mobile communication complex terminal characterized by said communicate mode change control means making a handover perform in the radio control section of said another side immediately in a mobile communication complex terminal according to claim 1 when the contents of a setting of said control unit can be automatic changed.

[Claim 3] It is the mobile communication complex terminal which said control unit is equipped with an information means to report to a user with one side or the both sides of a display and singing, in a mobile communication complex terminal according to claim 1, and is characterized by for said communicate mode change control means making the inquiry information to a user perform to a control unit when the contents of a setting of said control unit are automatic change no, and answering a change command input from a control unit, and making a handover perform in the radio control section of said another side.

[Claim 4] The two radio control sections which perform establishment, connection, and release of a wireless circuit to each ** in each of two mutually different migration communication system, The contents of a setting of said control unit are referred to during the message by one side of the control unit which awaits and can set up propriety of a compulsive change of the communicate mode during the time or a message, and said two radio control sections. When a compulsive change is good, The mobile communication complex terminal characterized by having the communicate mode change control means which one radio control section is made to stop electric-wave sending out, is made to perform a handover in the radio control section of another side, and changes the communicate mode.

[Claim 5] It is the handover change approach during the message characterized by to perform a handover to the migration communication system of another side automatically with reference to the contents of a change setting of talk mode when an automatic change is good when two message changes between migration communication system connected to a public network mutually-independent are permitted, a speech quality deteriorates during the message in one migration communication system and the handover based on it goes wrong.

[Claim 6] [when two message changes between migration communication system connected to a public network mutually-independent are permitted] When a speech quality deteriorates during the message in one migration communication system and the handover based on it goes wrong, when it is automatic change no, with reference to the contents of a change setting of talk mode It is the handover change approach during the message characterized by asking a user and performing a handover to the migration communication system of another side according to a change command input.

[Claim 7] It is the handover change approach during the message characterized by performing a handover to the migration communication system of another side immediately with reference to the contents of a change setting of talk mode during the message in one migration communication system when a compulsive change is good when two message changes between migration communication system connected to a public network mutually-independent are permitted.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the configuration block Fig. of the mobile communication complex terminal concerning the operation gestalt of this invention.

[Drawing 2] It is the whole communication network block diagram. (1) is a current network configuration and (2) is the network configuration of an operation gestalt.

[Drawing 3] It is the change explanatory view of the communication service of this operation gestalt.

[Drawing 4] It is the flow chart of handover change actuation of this operation gestalt.

[Drawing 5] They are explanatory views, such as a configuration procedure of a communicate mode change.

[Drawing 6] It is a sequence under message with PHS/cellular phone.

[Drawing 7] It is the sequence of a handover change with PHS.

[Drawing 8] It is the sequence of the handover change to a cellular phone from PHS.

[Drawing 9] It is the related sequence of the network at the time of the handover in the same system, and a base station.

[Drawing 10] It is the related sequence of the network at the time of the handover between systems, and a base station.

[Description of Notations]

10 Antenna

15 Walkie-talkie Control Section

16 21 Transmitter

17 22 Receiver

20 PHS Radio Control Section

30 Actuation Control Section

31 Main Control Section (CPU)

32 Microphone

33 Key Input Section

34 Liquid Crystal Display (LCD)

35 Lamp

36 Buzzer

40 Cellular-Phone Network

50 Public Network (ISDN Network)

60 PHS Network

70 80 Control station between systems

100 Mobile Communication Complex Terminal (Dual Terminal)

102,104 PHS base station

105,107 Pocket base station

[Translation done.]

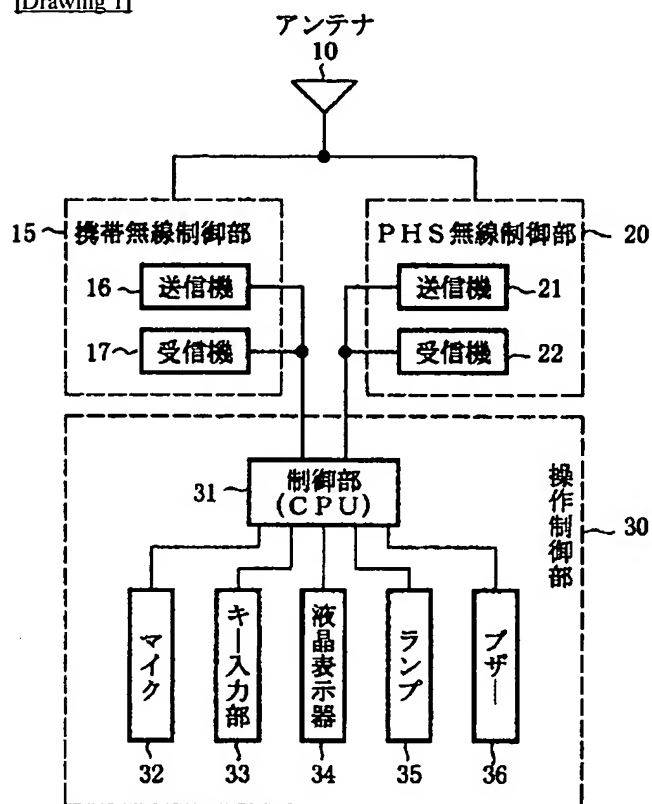
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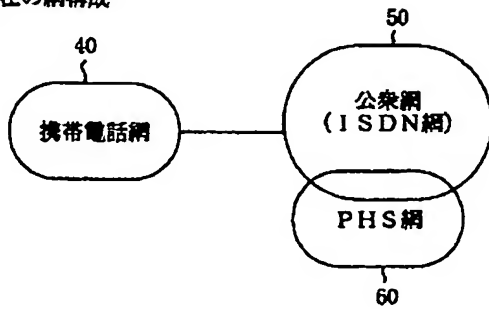
DRAWINGS

[Drawing 1]

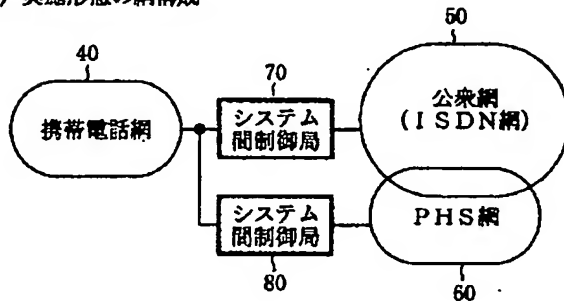


[Drawing 2]

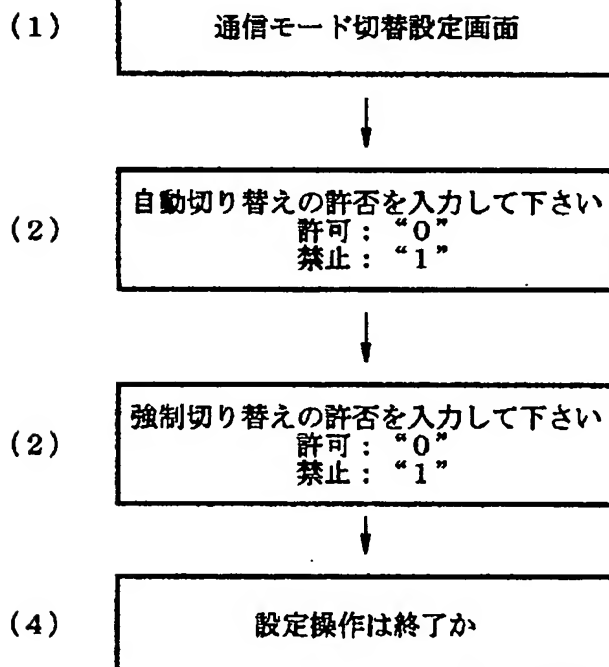
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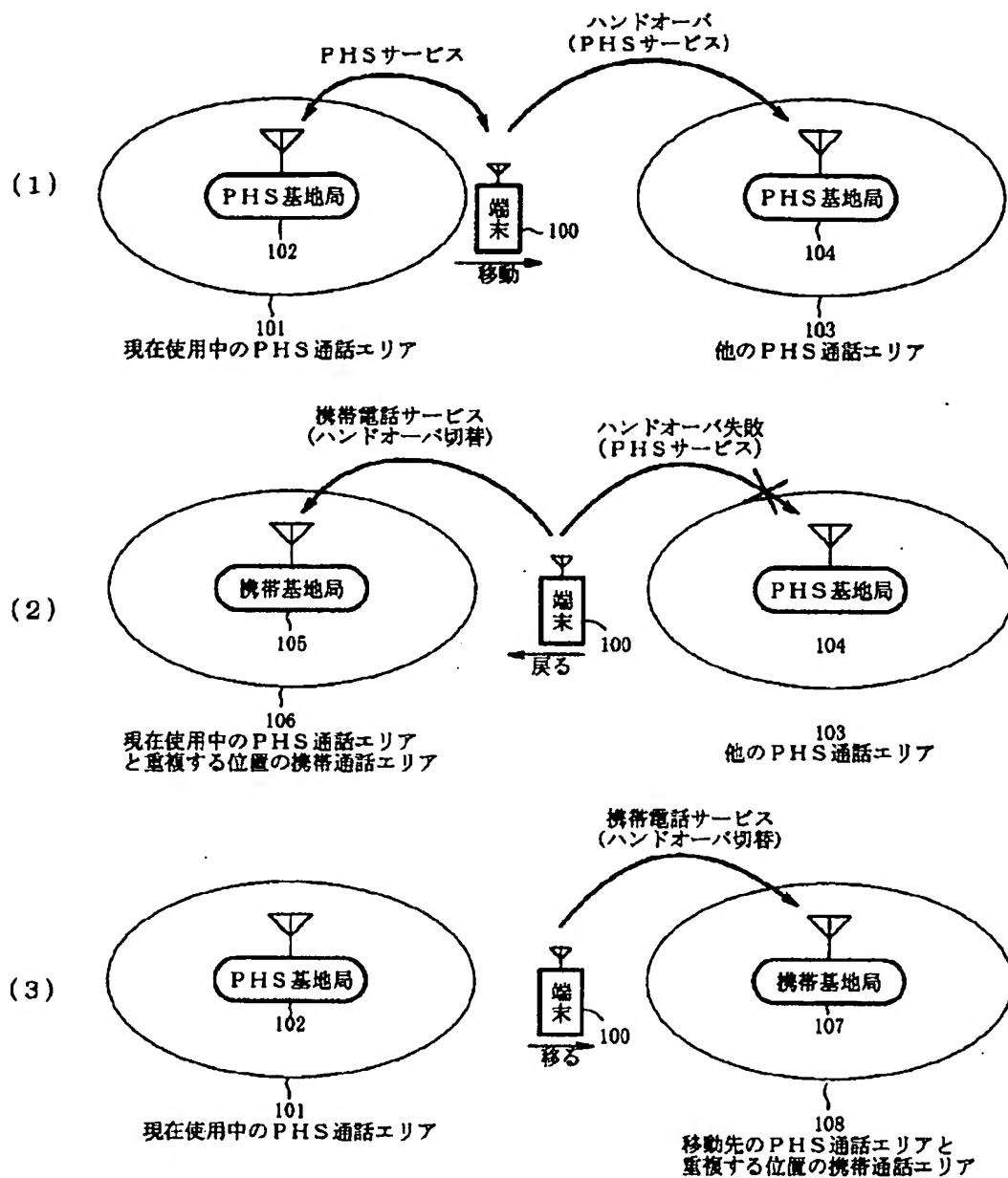
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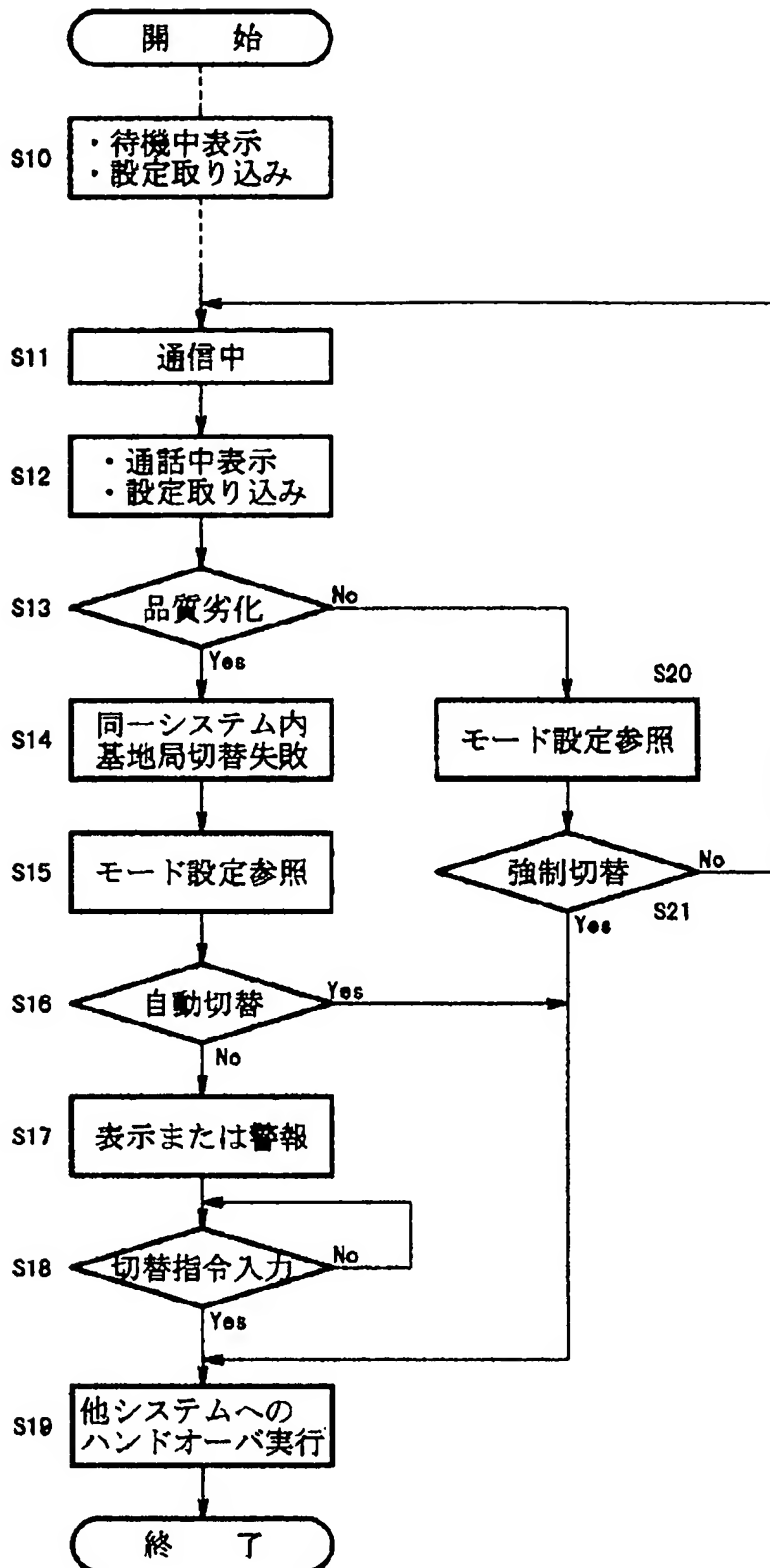
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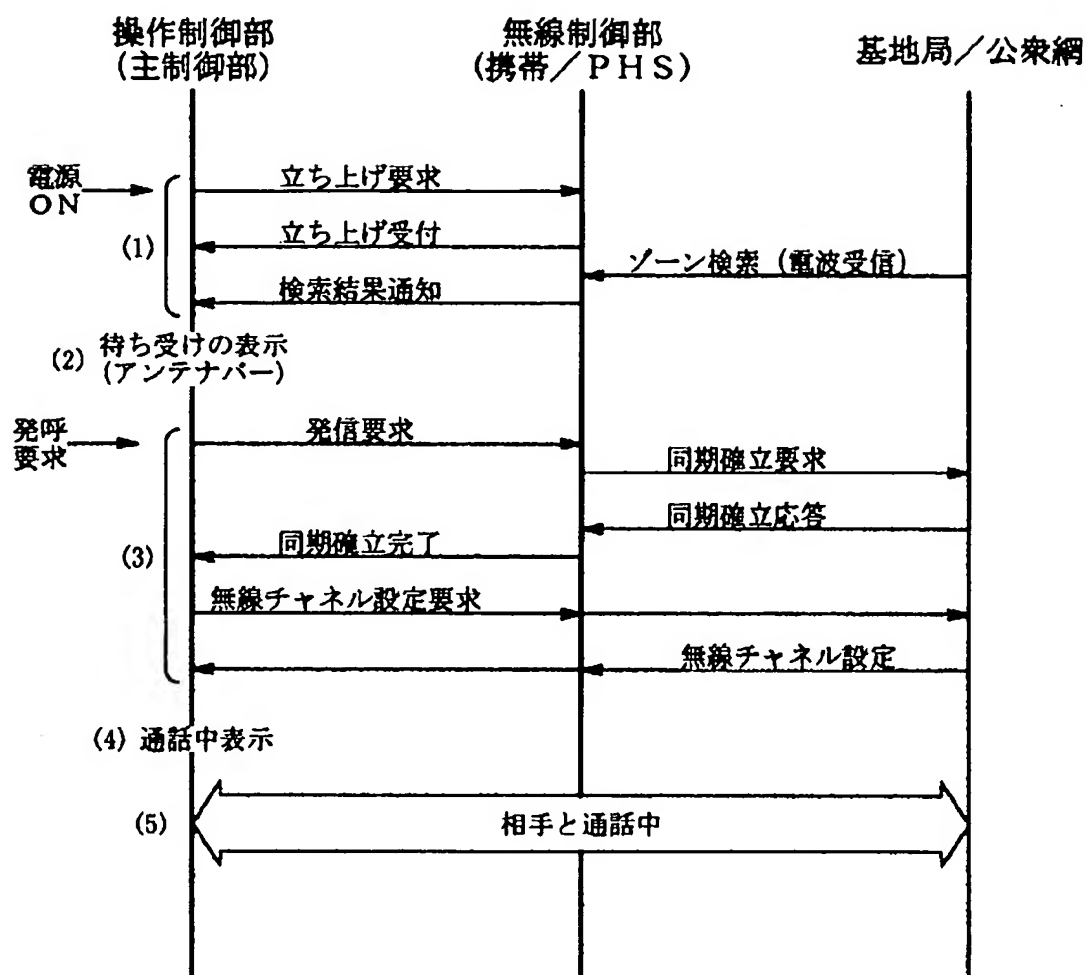
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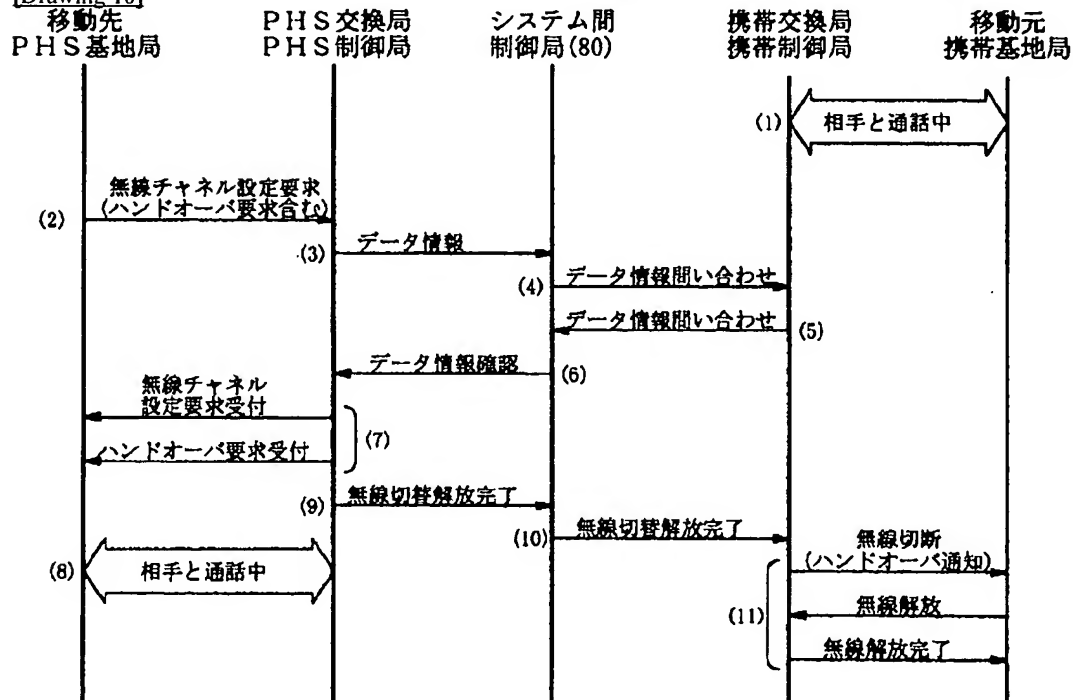
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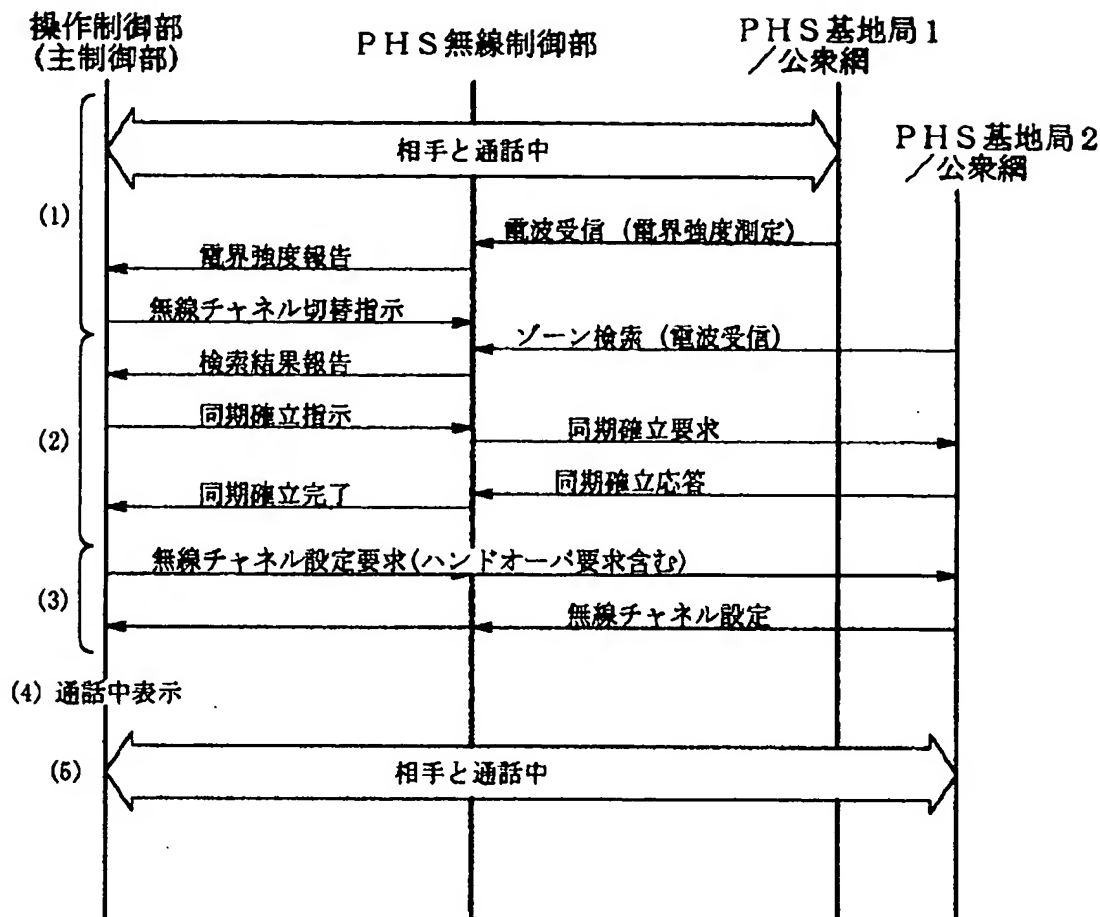
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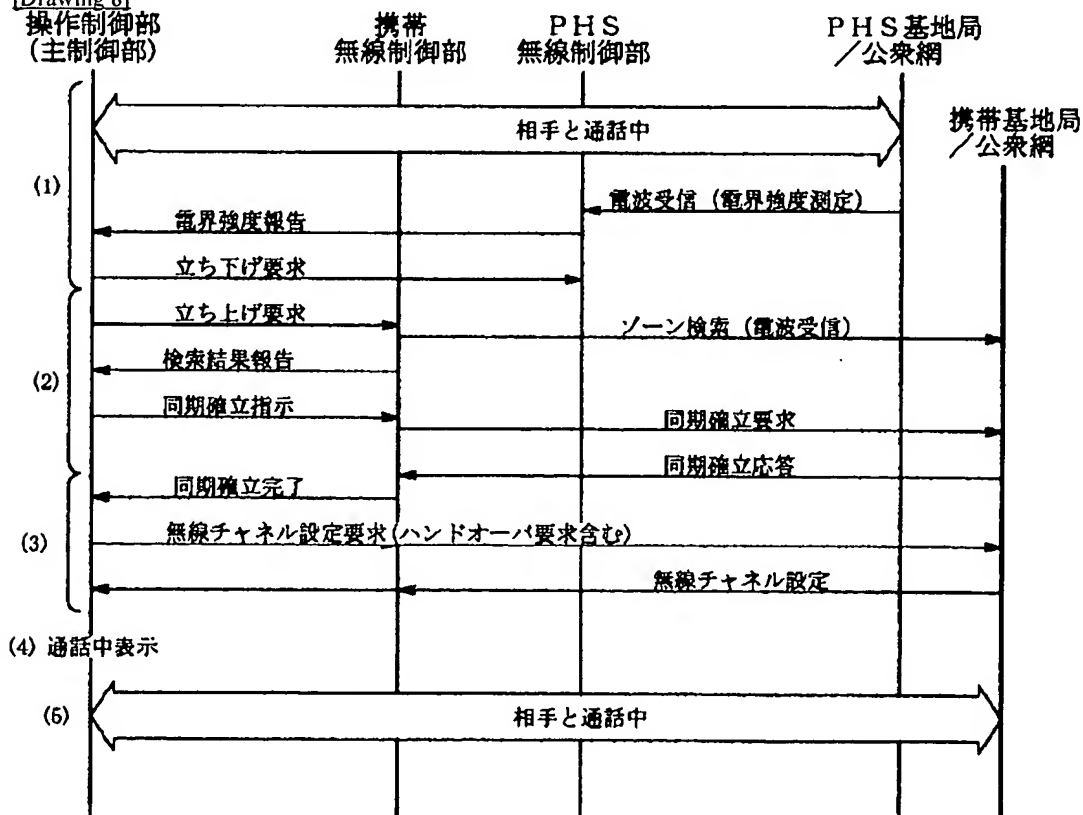
[Drawing 10]



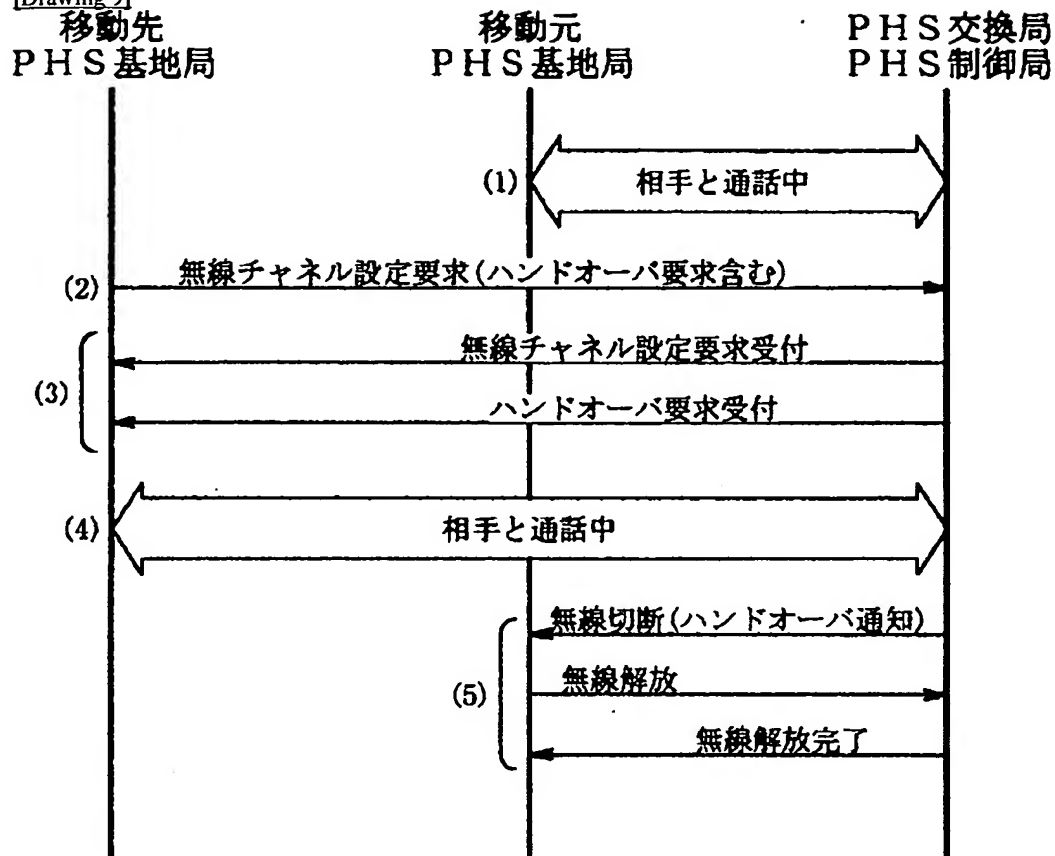
[Drawing 7]



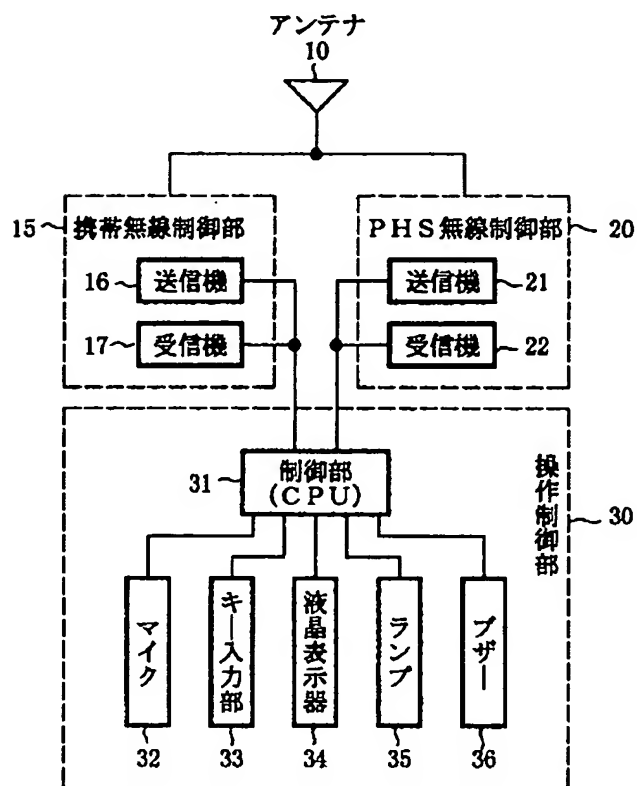
[Drawing 8]



[Drawing 9]



[Translation done.]

Drawing selection **Representative drawing** 

[Translation done.]

* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

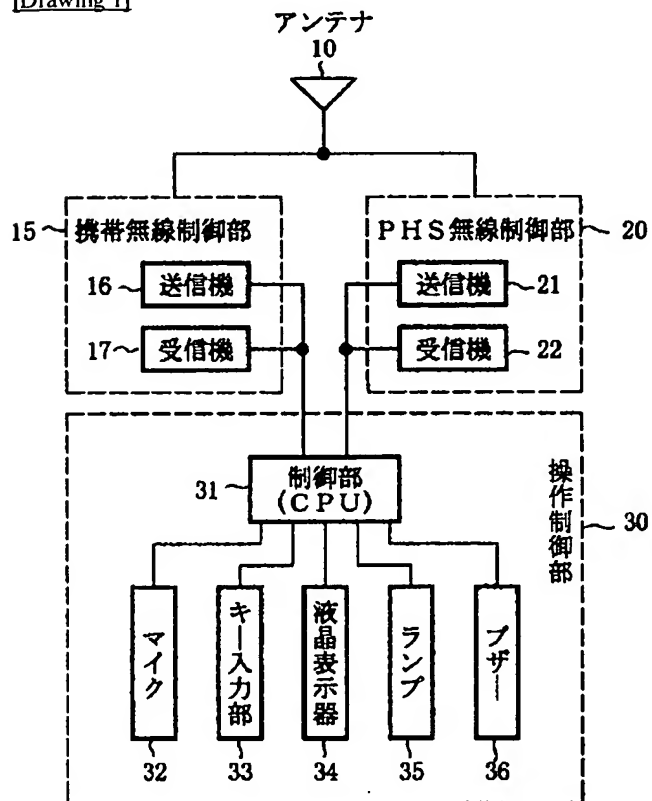
1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

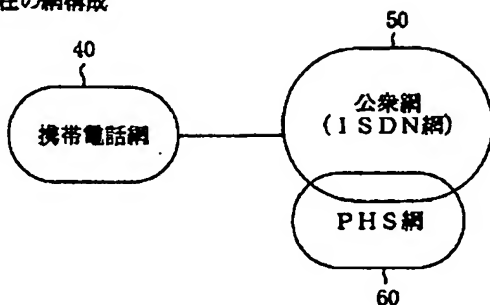
DRAWINGS

[Drawing 1]

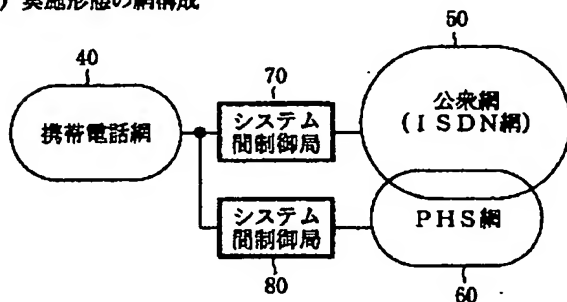


[Drawing 2]

(1) 現在の網構成



(2) 実施形態の網構成



[Drawing 5]

(1)

通信モード切替設定画面



(2)

自動切り替えの許可を入力して下さい
許可: "0"
禁止: "1"



(2)

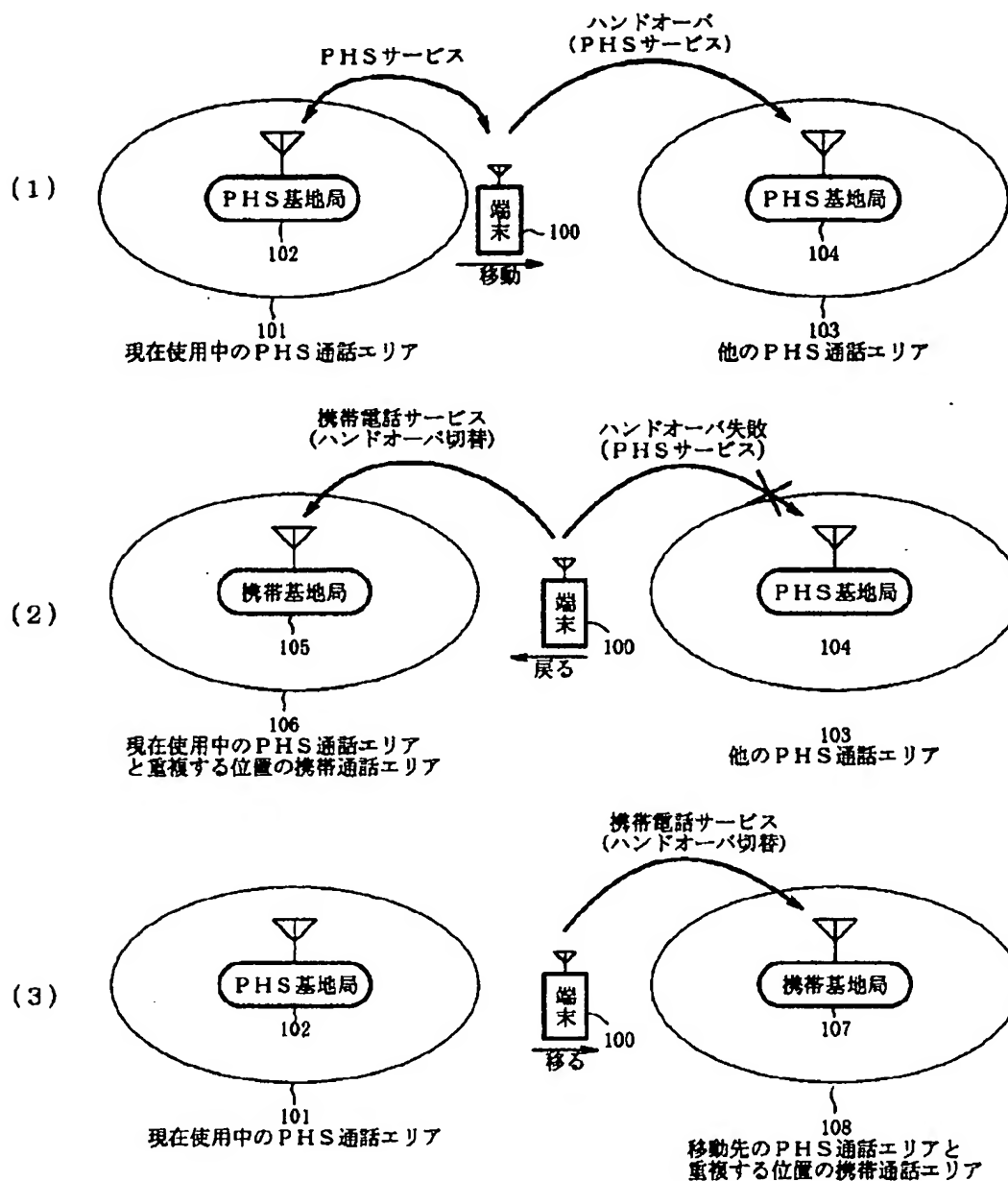
強制切り替えの許可を入力して下さい
許可: "0"
禁止: "1"



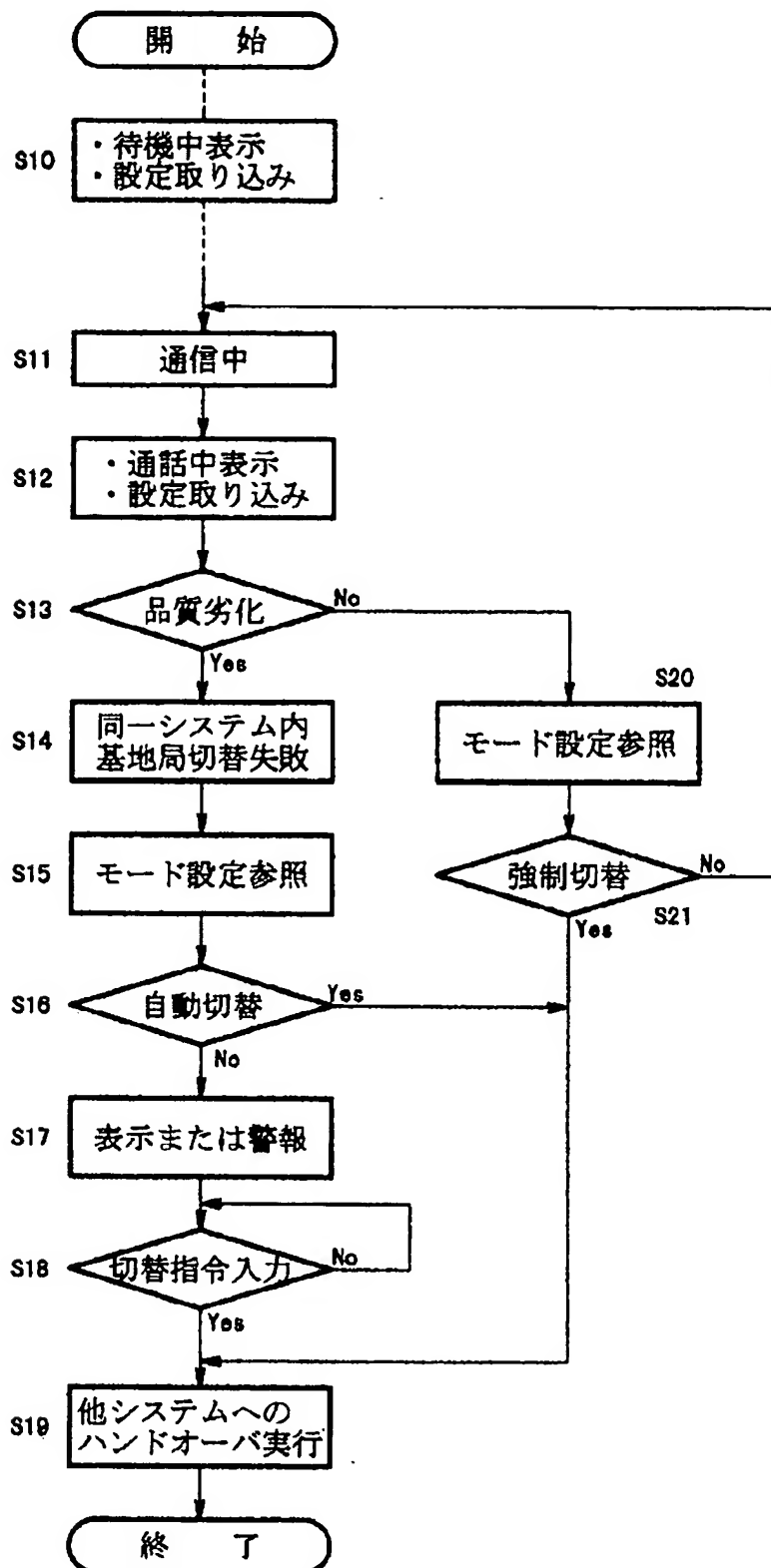
(4)

設定操作は終了か

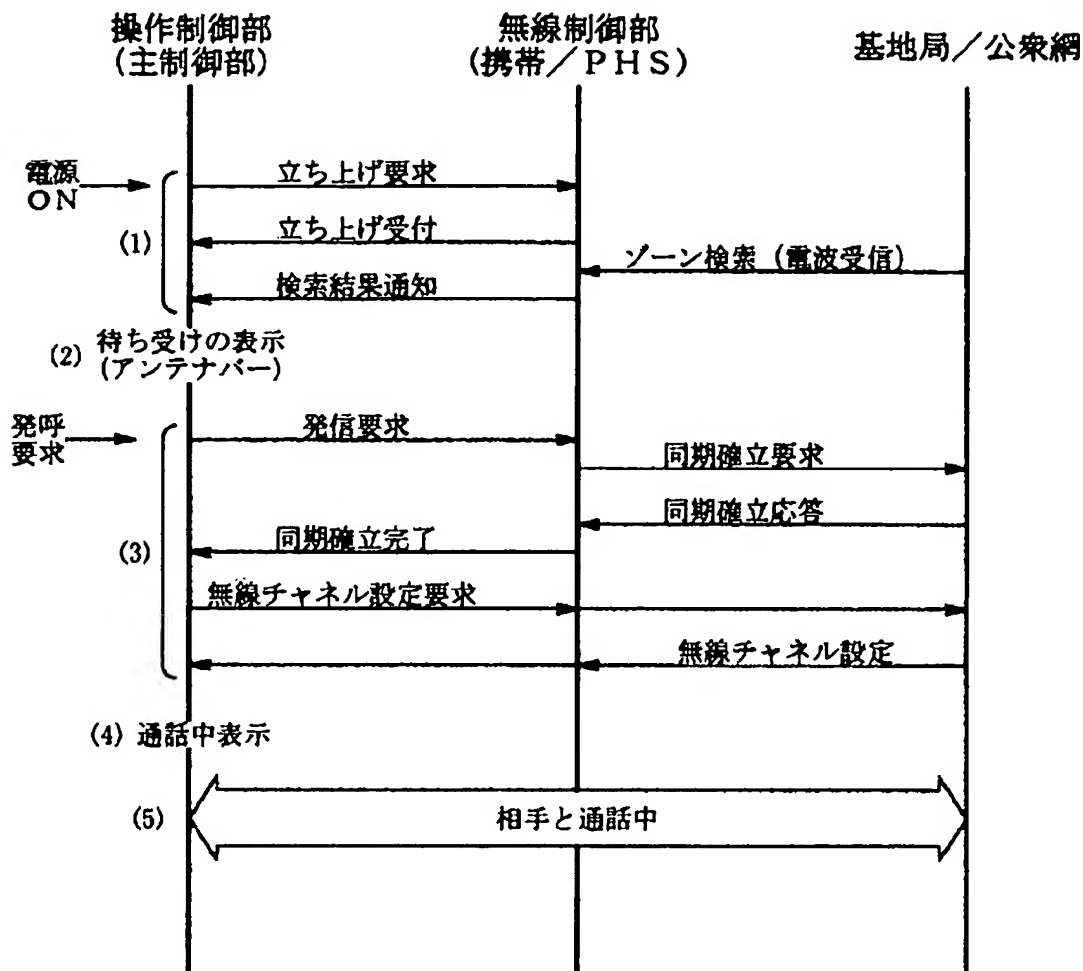
[Drawing 3]



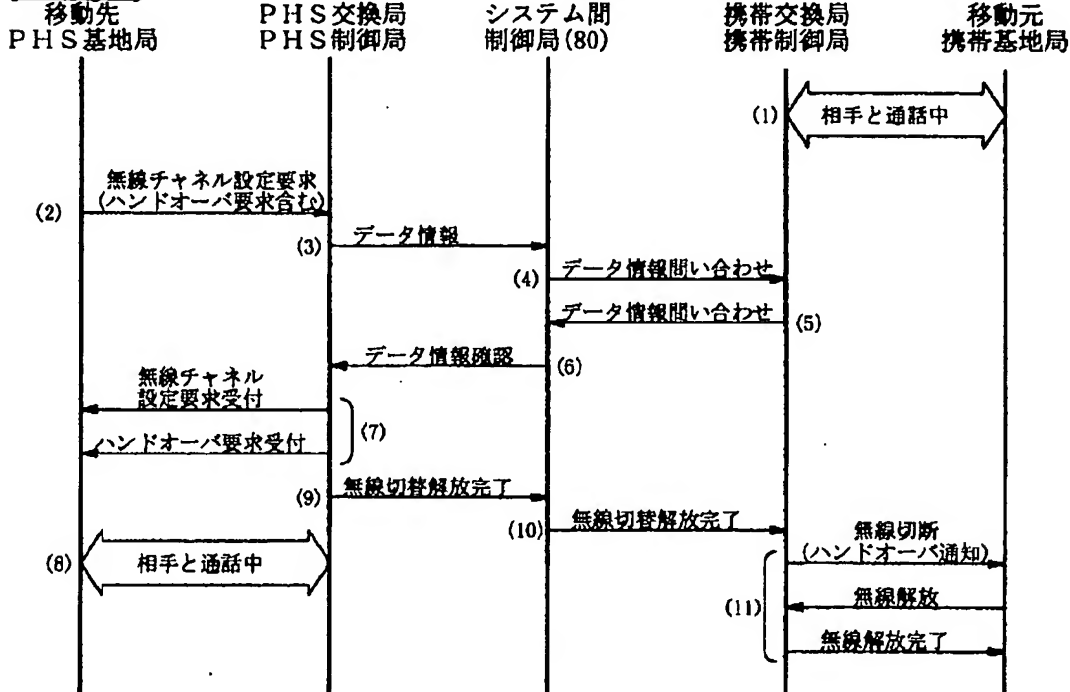
[Drawing 4]



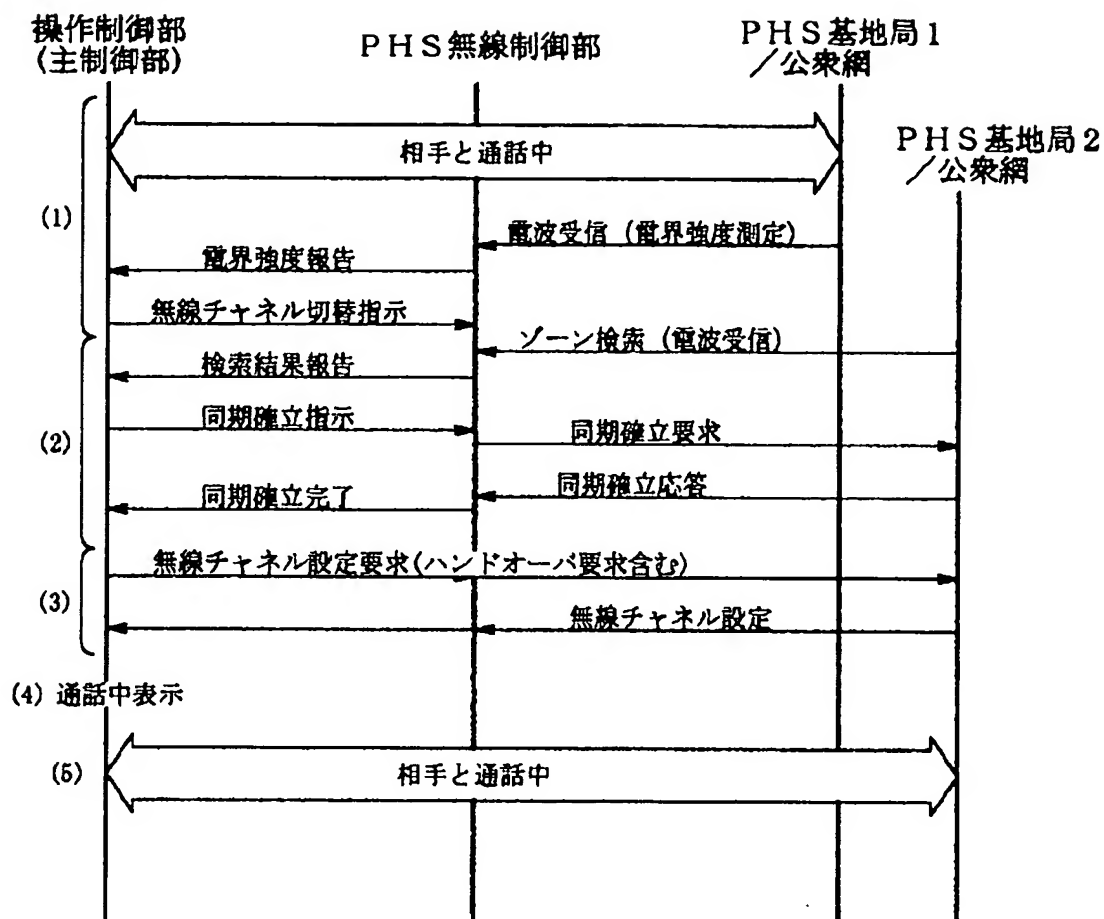
[Drawing 6]



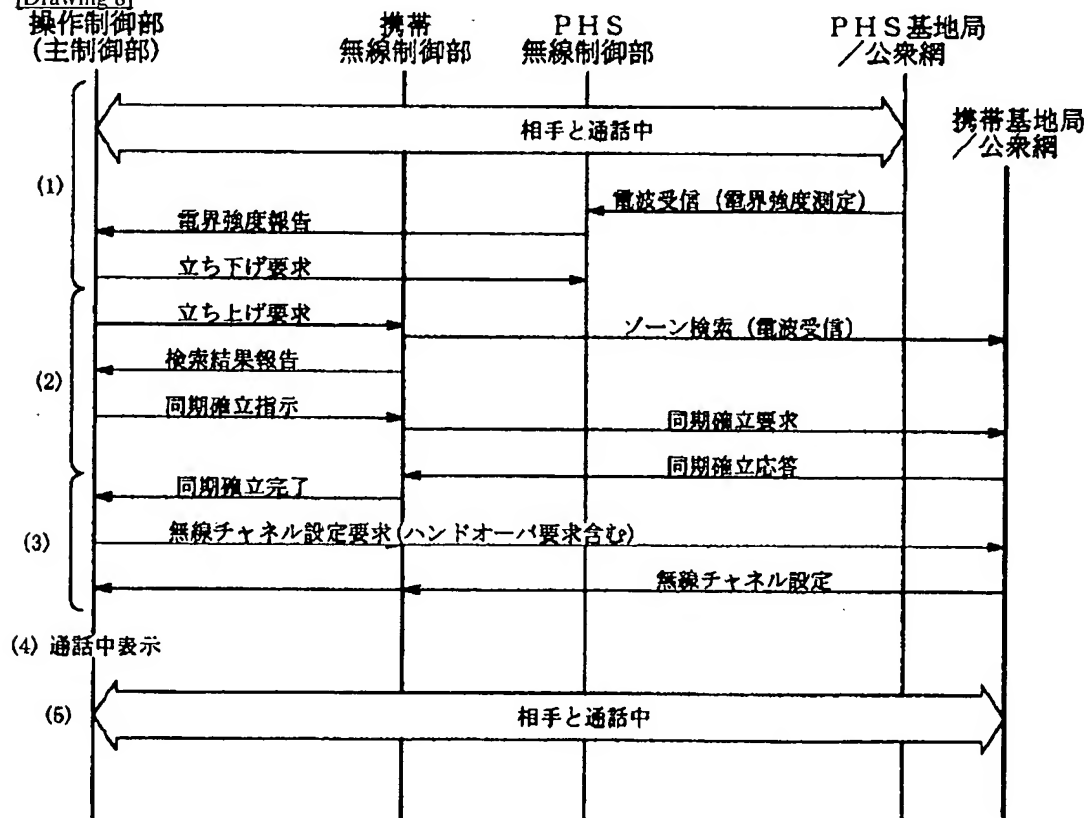
[Drawing 10]



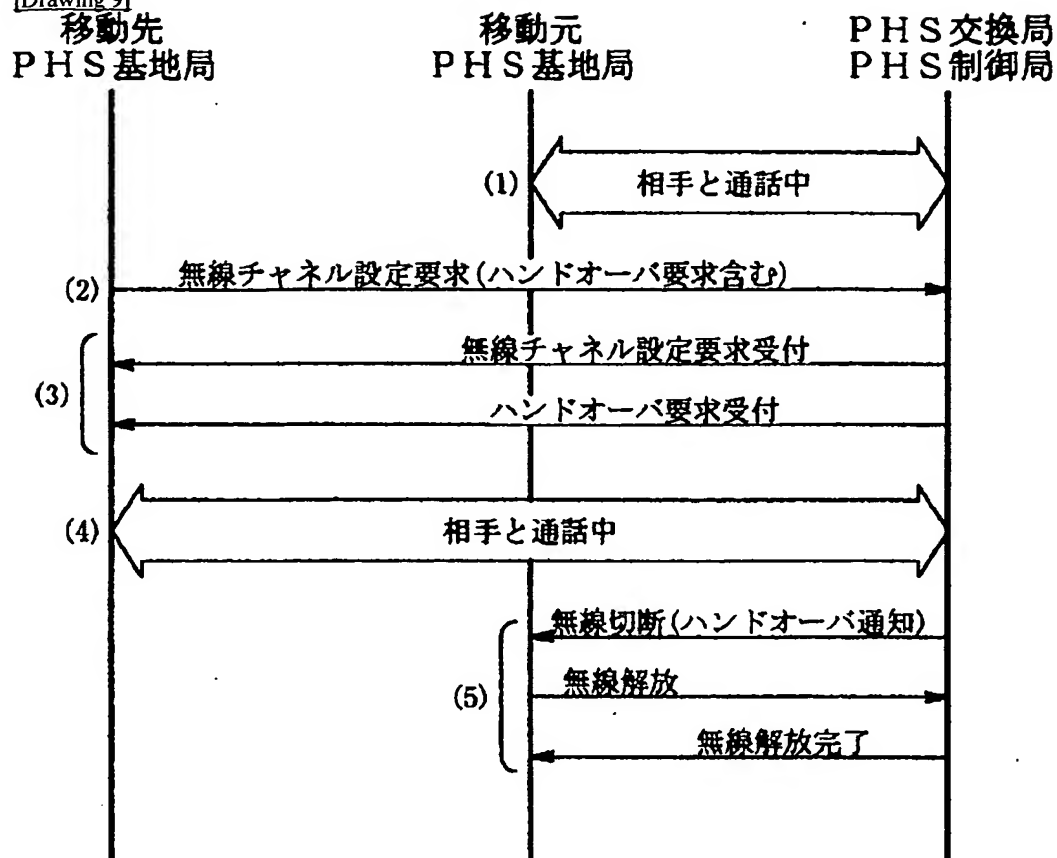
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]